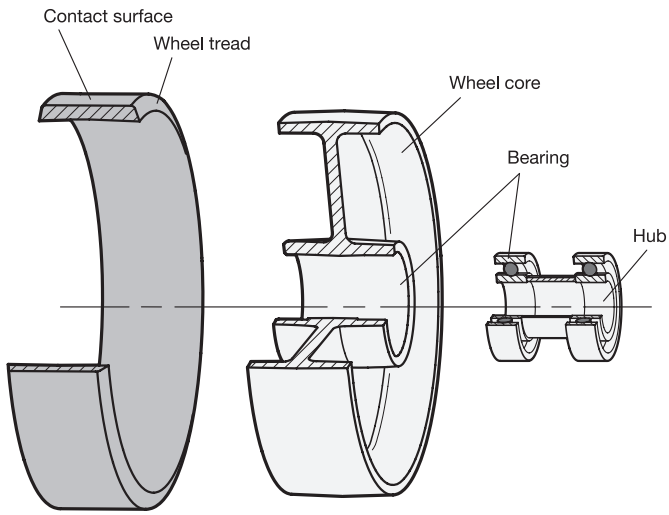
Wheel Structure

A wheel consists of the components **contact surface, wheel tread, wheel core, bearing** and **hub**. The properties and functions of these components are explained below.



The **contact surface** is the part of the wheel that touches the floor. It is also referred to as the profile. The contact surface may be smooth or textured to increase traction.

The **wheel tread** is the tire of the wheel. Its outer surface forms the contact surface. It can be made of various materials, and the associated material properties determine the potential areas of application for the wheel. It can be glued, vulcanized, cast or injection molded and is always firmly connected to the wheel body.

The **wheel core** is the main structural component of the wheel and serves as the rim, forming the connection between the tread and the bearing. Various designs are possible, such as versions with or without spokes, as well as a variety of materials. It can consist of a single part or multiple connected parts.

The **bearing** and the **hub** form the interface between the fixed axle and the wheel, which rotates around the axle. The selected bearing type has a direct influence on the running properties. A variety of wheel bearing types are used, such as ball bearings, roller bearings or friction bearings that run directly in the hub bore.

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Wheel Tread, Materials

The following material options are available for the wheels: **Rubber**, **polyurethane**, **polyamide** and **phenolic resin**. These materials are explained below.

The **rubber** tread is made of natural rubber and/or synthetic rubber-based elastomer. It is applied to the wheel either via vulcanization or injection molding and has the following properties.

+ High elasticity and ease of movement
+ Gentle on floors
+ Low-noise
+ Vibration-damping
- High starting and rolling resistance
- Abrasion possible on rough floors

The **polyurethane** tread consists of an elastomer produced exclusively from synthetic materials. The polyurethane is applied to the wheel either by casting or injection molding and has the following properties.

+ Low starting and rolling resistance
+ High elasticity
+ Good resistance to wear and tear
+ Gentle on floors
+ Leaves no marks
+ Resistant to many aggressive media

On **single-part** wheels, the tread is determined by the base material of the wheel body; in other words, the tread and wheel core are produced from the same material in a single manufacturing process. The characteristic properties of the respective materials are explained below.

Polyamide:

+ Good resistance to wear and tear
+ Low starting and rolling resistance
+ Leaves no marks
+ Resistant to many aggressive media
- Can absorb and release moisture

Phenolic resin:

+ Heat resistant
+ Resistant to many aggressive media
- Lower wear and tearing resistance

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Series		Coding	Wheel Ø (in inch)	Load capacity (in lbs)	Wheel material		
					Wheel tread	Wheel core	Hardness
WN 22872.1 Page XYZ		L	3 - 5	200 - 325	Rubber	Polyurethane	65 - 70 Shore A
		M	4 - 8	300 - 600			
		R	4 - 8	300 - 600			
WN 22876.1 Page XYZ		M	4 - 8	400 - 600		Cast iron	75 - 85 Shore A
WN 22882.1 Page XYZ		L	3 - 5	300 - 325	Polyurethane	Polyurethane	55 - 65 Shore D
		M	4 - 8	600 - 1000			50 - 60 Shore D
WN 22885.1 Page XYZ		R	4 - 8	800 - 1250		Aluminum	95 Shore A
WN 22887.1 Page XYZ		M	4 - 8	700 - 1250		Cast iron	85 - 95 Shore A
WN 22892.1 Page XYZ		M	4 - 8	1250 - 1250	Nylon		75 - 85 Shore D
WN 22893.1 Page XYZ		L	3 - 5	200 - 300	Polyurethane		60 - 70 Shore D
		M	4 - 8	500 - 900			
WN 22894.1 Page XYZ		M	4 - 8	800 - 1250	Phenolic		102 Rockwell E
WN 22896.1 Page XYZ		M	4 - 8	700 - 1250	Cast iron		145 HB

L = Light version
M = Medium version
R = Medium version, round tread

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Series	Coding	Temperature (in °F)	Bearing Type			
			Plain bearing (Delrin®)	Annular ball bearing	Precision ball bearing	Roller bearing
WN 22872.1 Page XYZ	L	- 45 °F + 180 °F	x	x		
	M					x
	R					x
WN 22876.1 Page XYZ	M	- 40 °F + 180 °F				x
WN 22882.1 Page XYZ	L	- 45 °F + 180 °F	x	x	x	
	M	- 40 °F + 180 °F				x
WN 22885.1 Page XYZ	R	- 40 °F + 180 °F			x	
WN 22887.1 Page XYZ	M	- 40 °F + 180 °F				x
WN 22892.1 Page XYZ	M	- 30 °F + 220 °F			x	
WN 22893.1 Page XYZ	L	- 20 °F + 180 °F	x	x		
	M					x
WN 22894.1 Page XYZ	M	- 65 °F + 265 °F				x
WN 22896.1 Page XYZ	M	- 15 °F + 800 °F				x

L = Light version
M = Medium version
R = Medium version, round tread

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